A wet and dull April

Description

It will be no surprise for many to hear that April 2024 has been a wet month. In what has felt like an unsettled spring so far, the UK has had its sixth wettest April since the series began in 1836, according to provisional statistics from the Met Office.

Sunshine has been in short supply, with the UK provisionally recording just 79% of its long-term average for the month.

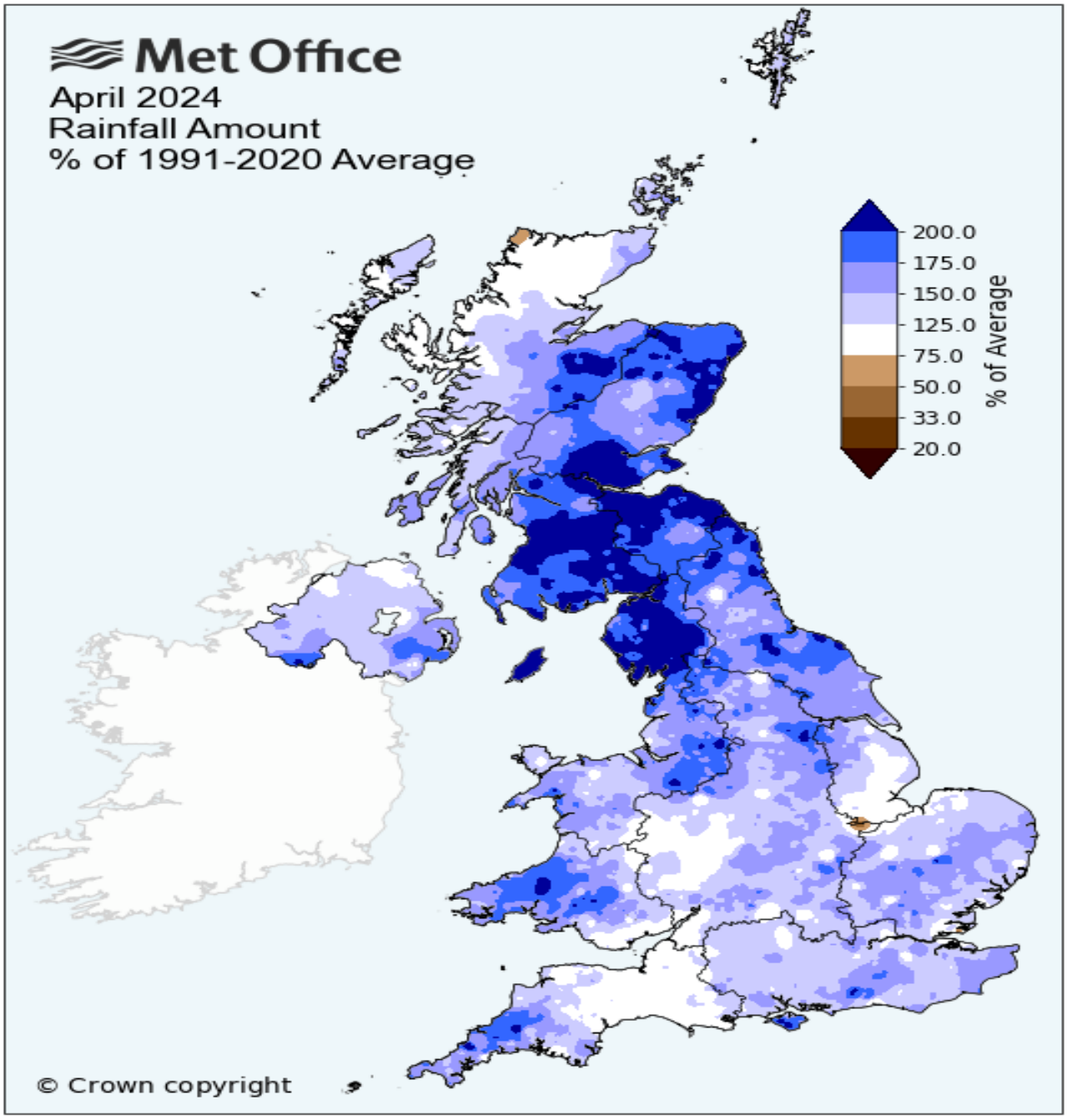
Wetter than average

The UK experienced 55% more rainfall than an average April, with 111.4mm falling across the month, making it the sixth wettest April in the series and the wettest April since 2012.

Many areas recorded more than their long-term average monthly rainfall, with Scotland experiencing its fourth wettest April in a series which started in 1836. It saw 148.9mm of rainfall across the month – more than 60% of its average and the wettest April since 1947.

Some places in Scotland saw more than double their average rainfall for the month. Edinburgh in particular saw very large rainfall totals, receiving 239% of its average April rainfall, which is its second wettest on record, falling only behind totals in 2000. East and West Lothian, Aberdeen, Clackmannan, Berwickshire and Cumbria, among others, also recorded more than double their average rainfall in the month. A rain-gauge at Honister Pass in the English Lake District recorded more than 400mm of rain.

Met Office Scientist Emily Carlisle said: “April has been a continuation of the past few months: often wet, windy and unsettled. April showers were present from the beginning of the month, with frontal systems bringing persistent precipitation across the UK. Although a high-pressure system moved over the UK on the 20th bringing some drier weather, by the end of the month, low pressure was back in charge, bringing with it more rain.”

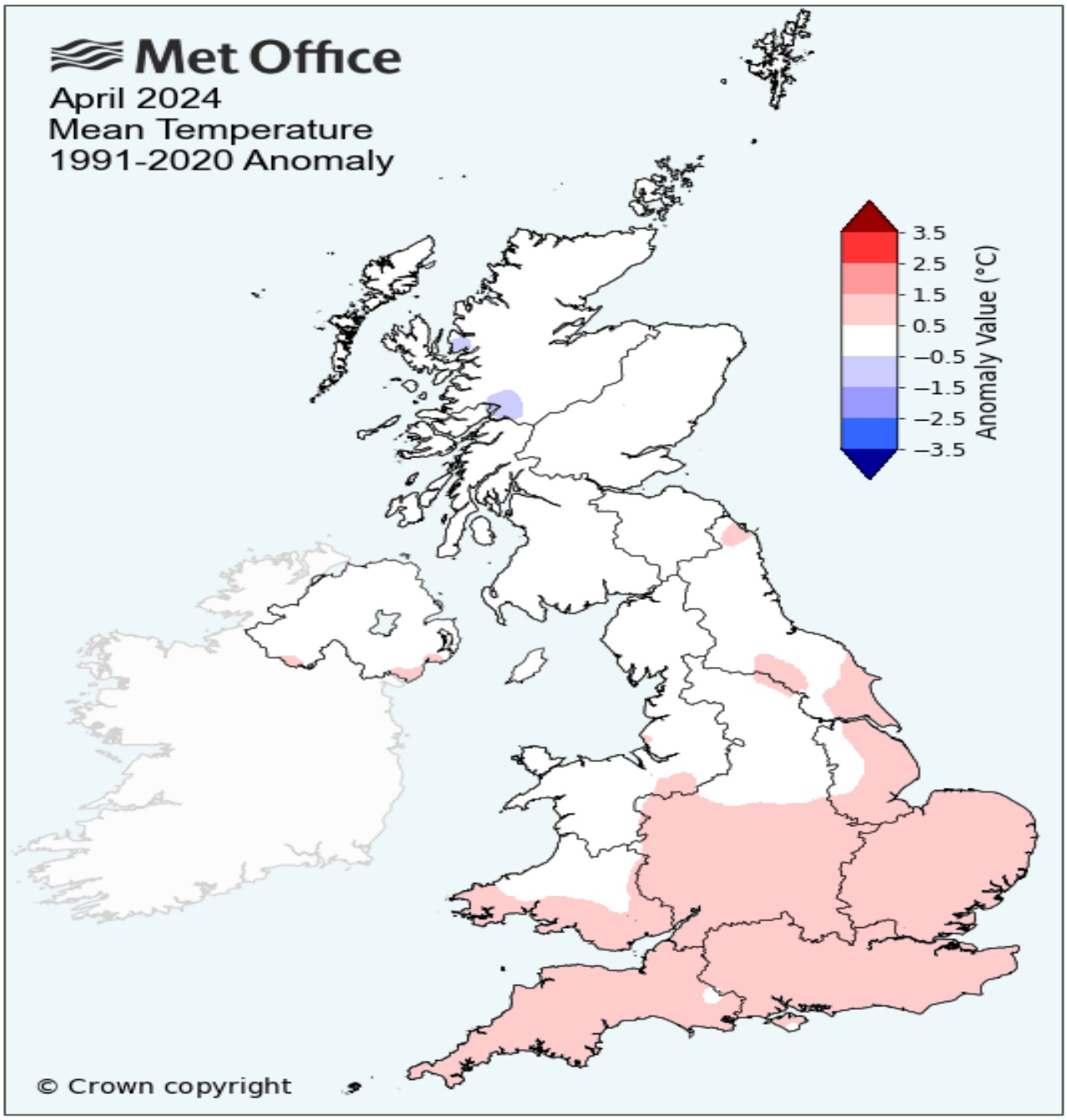


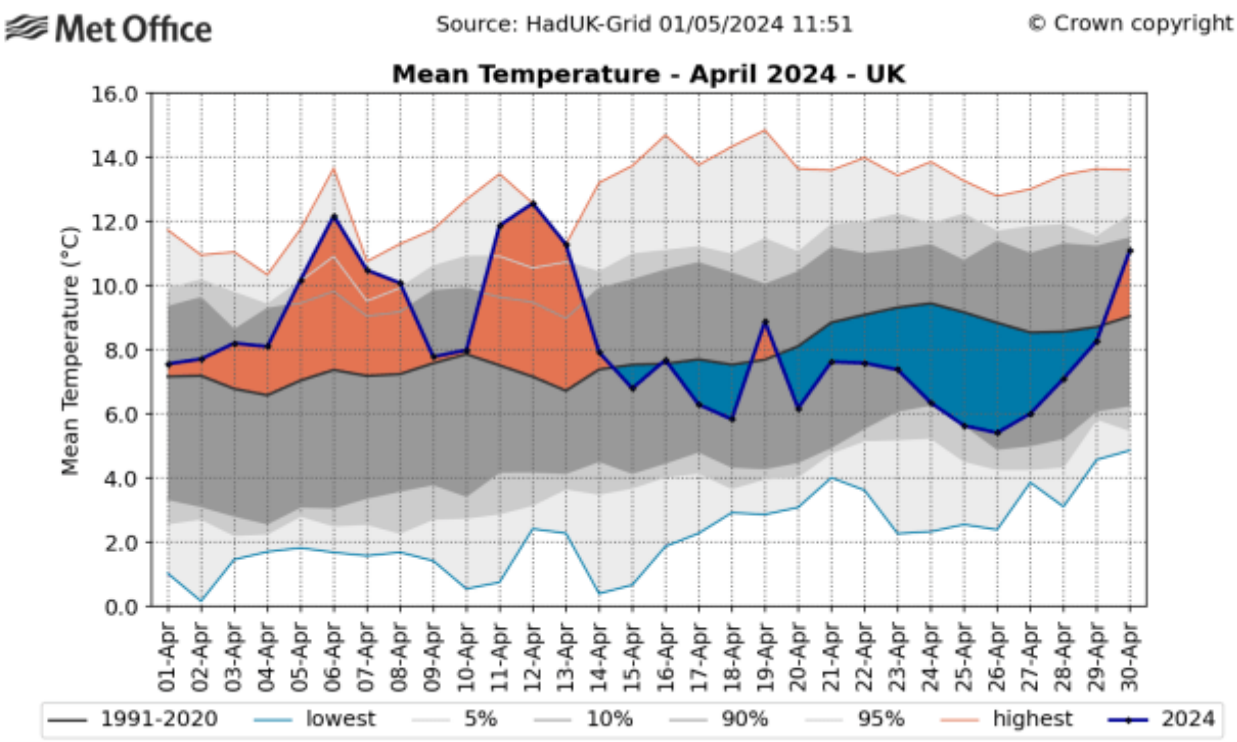
Temperatures around average

April was a month of two halves when it comes to temperatures. The month started off warm, particularly along the southeast coast of England. Writtle in Essex recorded 21.8°C, making it the hottest day of 2024 so far in the UK.

Temperatures then dropped, remaining slightly below average for most of the last two weeks of April. This balanced out the warmer temperatures at the start of the month and resulted in a provisional average mean temperature of 8.3°C for the UK, only 0.4°C higher above the 1991-2020 long-term average.

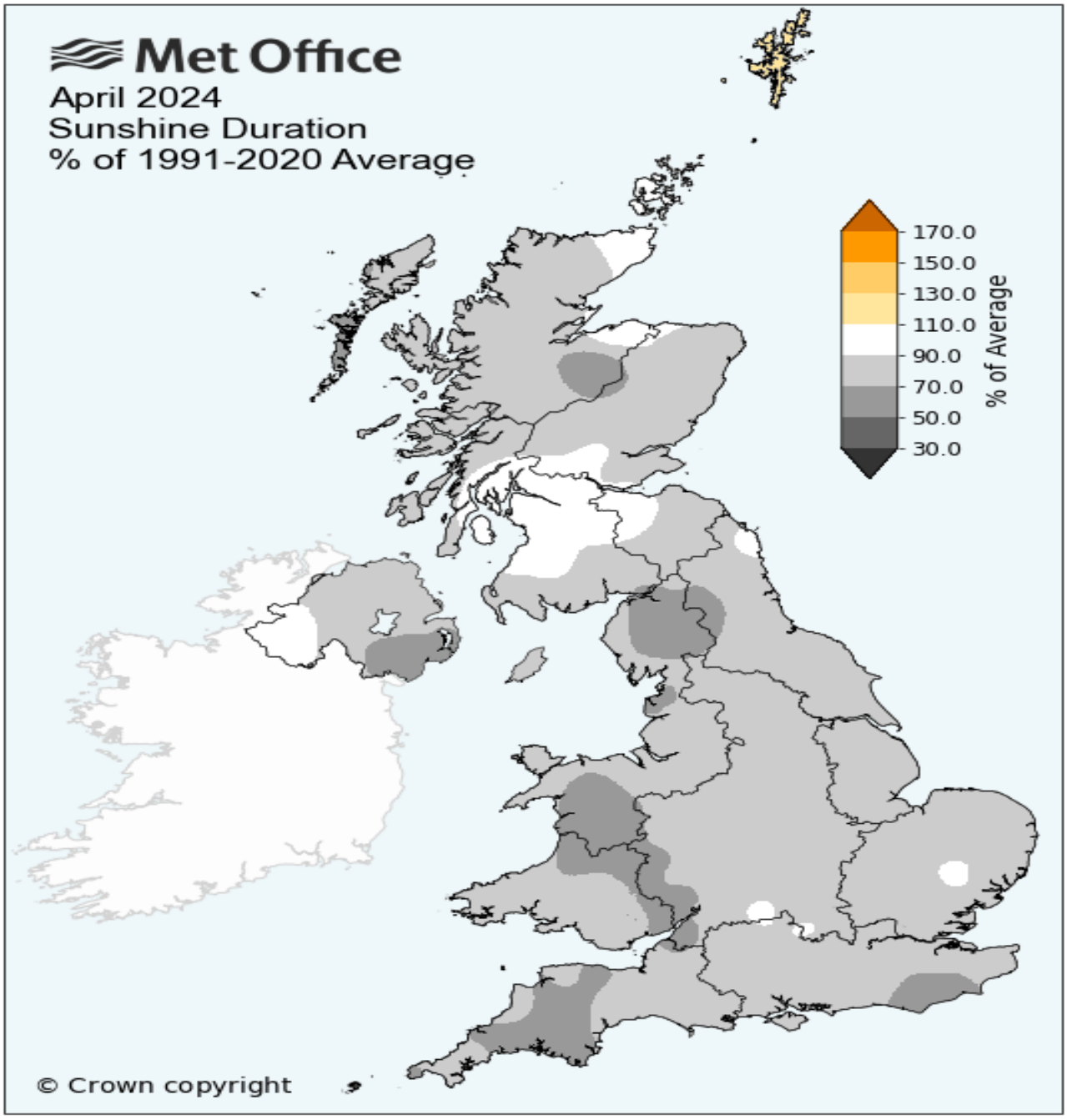
Cloudy conditions often resulted in overnight temperatures being held up, with the average minimum temperature being above average (+0.8°C).





A dull month

Along with being a wet month, April has also been a dull month. The UK provisionally recorded 79% of the long-term average sunshine duration, with 122.9 hours.



One named storm

April saw Storm Kathleen arrive on the 6th, bringing heavy rain to Scotland, Wales, parts of Northern Ireland and the west coast of England. Kathleen also brought strong winds across the UK, with gales along coasts, particularly in the north and west of the UK. Kathleen was the eleventh named storm of the 2023/24 season. This is only the second time that the Met Office has reached the letter K since they began naming storms in 2015.

Spring so far…

Meteorological spring (March to May) so far has been wet. Both England and Wales have already seen

more than their long-term average rainfall for the entirety of the season, while the UK has seen 96%. At this point in the season, we'd expect to see 66% of average.

Provisional April 2024	Mean temp (°C)		Sunshine (hours)		Rainfall (mm)	
	Actual	Diff from avg (°C)	Actual	% of avg	Actual	% of avg
UK	8.3	0.4	122.9	79	111.4	155
England	9.3	0.6	127.0	78	85.5	152
Wales	8.5	0.4	113.3	72	135.8	154
Scotland	6.6	0.0	119.2	84	148.9	160
N Ireland	8.3	0.3	118.4	80	104.6	141

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May 2024

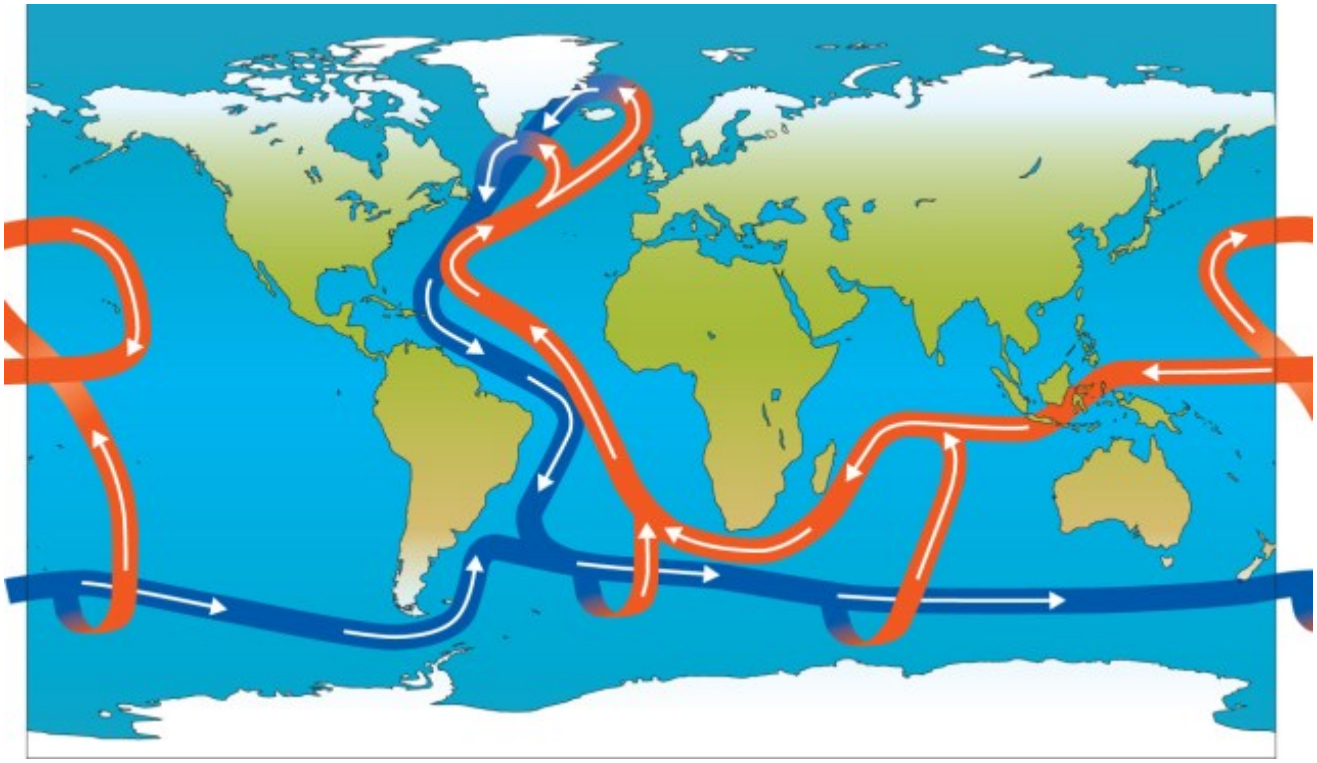
The Atlantic Meridional Overturning Circulation in a changing climate

Description

For 20 years, an array of instruments strung across the North Atlantic has been monitoring the strength of one of the largest and most important systems of ocean currents in the world.

The Atlantic Meridional Overturning Circulation (AMOC), which includes the Gulf Stream, moves heat northwards in the Atlantic and means that Europe is milder than it would otherwise be. Potential climate change-induced collapse of the system has been suggested, but what have scientists discovered with two decades of monitoring?

The ocean plays a key role in our climate system by taking up heat from the atmosphere and moving it around the globe. The AMOC system of currents moves water northwards in the upper ocean from the tropics towards the northern North Atlantic, where the water loses its heat to the atmosphere and becomes colder and sinks. Deep waters return southwards and travel around the globe, returning to the surface through winds in the Southern Ocean and through mixing.



Ocean circulations with blue arrows indicating cold deep water and red arrows indicating warm surface water.

Weakening of the AMOC

Laura Jackson is a Met Office scientist who has studied North Atlantic ocean currents for many years.

She said: “The AMOC strength can vary from one decade to the next, which affects weather patterns in the UK and Europe. A warming climate makes it harder for the northern waters to cool and sink, and so it is considered very likely that the AMOC will weaken with human-induced climate change. This weakening would reduce the heat moved northwards, so Europe would experience less warming than if the AMOC didn’t weaken. This could reduce the impact of global warming in this region but may also cause other changes in our weather patterns such as more winter storms.”

AMOC collapse

She continued: “One unlikely possibility is that the AMOC might reach a ‘tipping point’ causing it to rapidly weaken. In that case the cooling from AMOC weakening would be stronger than the background warming, and we would experience colder temperatures. Although this is unlikely to happen, it could have devastating impacts, causing cooling in the North Atlantic, large changes in precipitation, shifts in regional weather patterns and large impacts on ecosystems and human activities. UK and European impacts are explored in the latest Marine Climate Change Impacts Partnership Ocean Circulation report. Changes in temperature, wind and rainfall patterns as well as increases in storm surges would have wide implications for the UK such as impacts on agriculture, marine industries and renewable energy production.

The Intergovernmental Panel on Climate Change (IPCC) AR6 (sixth assessment) report judged that, although a weakening of the AMOC by 2100 is very likely, there is medium confidence that a collapse will not occur. However, given the potential impacts, this it is still an important area of research.

Observations

She added: “The international community has been observing the AMOC at 26^{o}N for the last 20 years at the RAPID array. These observations have been very useful for testing how well our climate models are representing the AMOC and for understanding how the AMOC affects the climate. We have also seen how the AMOC varies on many different timescales – in particular it weakened over the first decade and then stabilised, or possibly strengthened. Changes from one decade to another are expected from natural climate variability, so it is hard to detect a long-term weakening from climate change. Hence, we need longer a time series. Other ways of monitoring the AMOC (such as recent observations further north at the OSNAP array) are also useful additions.”

Ongoing research

Laura concluded: “There is ongoing research in the Met Office to improve our understanding of how the AMOC might change in the future and what impacts that would have on our weather and society.” Scientists are also investigating AMOC tipping points through the EU project ClimTip.

Date Created
May 2024

Met Office and Deaf Academy link up for training

Description

How can we make our resources more accessible to the deaf community? That is the question Met Office staff have been discussing with members of the Deaf Academy.

Through online and in-person workshops, we have been working with students to develop a greater understanding of their needs and preferences when it comes to information about weather and climate.

Mark Stocks, the Academy's partnership and community manager said: "Sometimes people don't communicate with a deaf person, as they are afraid of getting that communication wrong. So through these sessions, we aim to reassure people and give them the tools they need to take away that fear."

The workshop included the students delivering a British Sign Language (BSL) workshop to participants, which included a section on popular meteorological terms.

Deaf Academy student Hugh, 24, said it was "important to teach deaf awareness to hearing people in order to help them understand deaf culture", and Timothy, 19, said the community needed to "feel included in a hearing world" because "it helps ensure the two communities are more integrated."

The students also talked about how they receive their news and weather, as well as looking at various Met Office content and discussing how they could be improved to make them even more accessible.

Susan Ward-Rice, Equality, Diversity and Inclusion Specialist Partner at the Met Office said: "We are continuously striving to be as inclusive as possible with everyone we engage with, whether that be through our recruitment or the content we produce.

"I found the awareness sessions engaging, educational and informative. It's been really useful to show some of our communications content to the students and find out how we can make our resources even more accessible and inclusive to members of the D/deaf community."

Engaging with and understanding the diversity of our people and those we serve is a key priority of the Met Office, and we look forward to working with the Deaf Academy more in the future.

View this post on Instagram

t shared by Weather from the Met Office (@met

Deaf Awareness Facts

There are 12 million adults in the UK who are deaf, have hearing loss or tinnitus.

There is no consensus on the total number of BSL users or deaf BSL users in the UK. The 2021 Census reports 22,000 people use BSL as their main language in England and Wales.

The British Deaf Association estimate that the total number of people in the UK who use BSL (not necessarily as their main language) is estimated to be 151,000.

Sometimes, you might see the word deaf as Deaf or D/deaf. The capitalisation of Deaf is often used by people who see their deafness as more than just a disability, but also their cultural identity. Generally, sign language will be their first language.

People who have experienced hearing loss throughout life are less likely to share this sense of cultural identity and may describe themselves as ‘deafened’ or ‘hard of hearing’, with the latter term being more common among older people.

People who have retained a considerable degree of hearing might refer to themselves as ‘partially deaf’ or may refer to their level of hearing as mild to moderate.

9/10 of respondents to the RNID Subtitle It Report (2023) with hearing loss and who were deaf, usually or always use subtitles when watching TV.

People who are deaf or have hearing loss have individual communications, and you should ask someone how best you can communicate with them. RNID have produced some communication tips.

If you are organising events, make your event deaf aware. There are several different ways to make events more inclusive.

Date Created
May 2024

Building resilience: climate solutions for a changing world

Description

In an era defined by environmental uncertainty, the need to fortify our communities against the impacts of climate change has never been more pressing. Climate resilience – a term often heard in discussions surrounding climate action – refers to humanity's capacity to adapt and withstand the adverse effects of climate change while maintaining essential functions and minimizing disruption to livelihoods and ecosystems.

But what exactly are climate resilience and climate solutions?

Understanding Climate Resilience: Climate resilience encompasses a spectrum of strategies aimed at softening the risks posed by climate change. It involves building robust infrastructure, implementing sustainable land-use practices, fostering community preparedness, and enhancing ecosystem resilience. Essentially, it's about future-proofing societies and environments against the challenges of a changing climate.

Defining Climate Solutions: Climate solutions refer to the various interventions, technologies, and policies designed to address climate change and enhance resilience. These solutions span a wide range of sectors, from renewable energy and sustainable agriculture to disaster risk reduction and climate-smart infrastructure. By adopting and scaling up these solutions, society can partially adapt to climate impacts, and build a more sustainable future.

Case Studies: Met Office’s Climate Resilience Initiatives:

1. **Climate Services for Developing Nations:** The Met Office, in collaboration with international partners, provides climate services to developing nations to enhance their resilience to climate change. These services include tailored climate information, early warning systems for extreme weather events, and capacity-building initiatives to empower local communities to manage climate risks effectively. By equipping vulnerable regions with the tools and knowledge needed to anticipate and respond to climate impacts, the Met Office is helping build resilience on a global scale.

2. **Climate Change Adaptation in Urban Environments:** With rapid urbanisation and population growth, cities face unique challenges in the face of climate change. The Met Office is involved in research and development projects aimed at enhancing climate resilience in urban environments. This includes modelling future climate scenarios, assessing climate risks to infrastructure and communities, and developing adaptation strategies to bolster resilience. By integrating climate considerations into urban planning and infrastructure development, cities can better withstand the impacts of extreme weather events and changing climate patterns.

3. **Enhancing Agricultural Resilience:** Agriculture is particularly vulnerable to the impacts of climate change, with shifting weather patterns, extreme temperatures, and fluctuations in rainfall posing significant challenges to food security and livelihoods. The Met Office collaborates with agricultural stakeholders to consider climate-smart farming practices, improve crop forecasting capabilities, and provide climate information to farmers. By promoting sustainable agriculture and supporting adaptive measures, the Met Office is helping farmers build resilience to climate variability and ensure food security for future generations.

In conclusion, ‘resilience’ is not just a buzzword; it’s critical for safeguarding our planet and securing a sustainable future for all. By embracing climate solutions and investing in resilience-building initiatives, we can navigate the challenges of a changing climate and create a more resilient, equitable, and prosperous world for generations to come.

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May 2024

How do autonomous vehicles react to the weather?

Description

A new discussion paper from the Met Office and the National Physical Laboratory (NPL) highlights the practical challenges of understanding the performance of autonomous vehicles (AVs) in different weather conditions.

The paper draws from an ongoing project conducted by the Met Office and NPL and is funded by the UK's Centre for Connected and Autonomous Vehicles (CCAV).

This Sensor Assurance Framework (SAF) project aims to create a reliable and usable framework for understanding how well AV perception sensors (the eyes and ears of the vehicle) perform in different weather-related conditions. When fully developed, this framework will support validation, safety assurance and simulation testing of AVs across the UK.

Central to SAF project has been the Cardington weather-sensor testbed, which has accumulated over two years of detailed weather measurements and corresponding AV sensor measurements as they observe targets set up at varied distances in a wide range of weather conditions including fog, intense rainfall, clear and cloudy skies and direct sunlight.

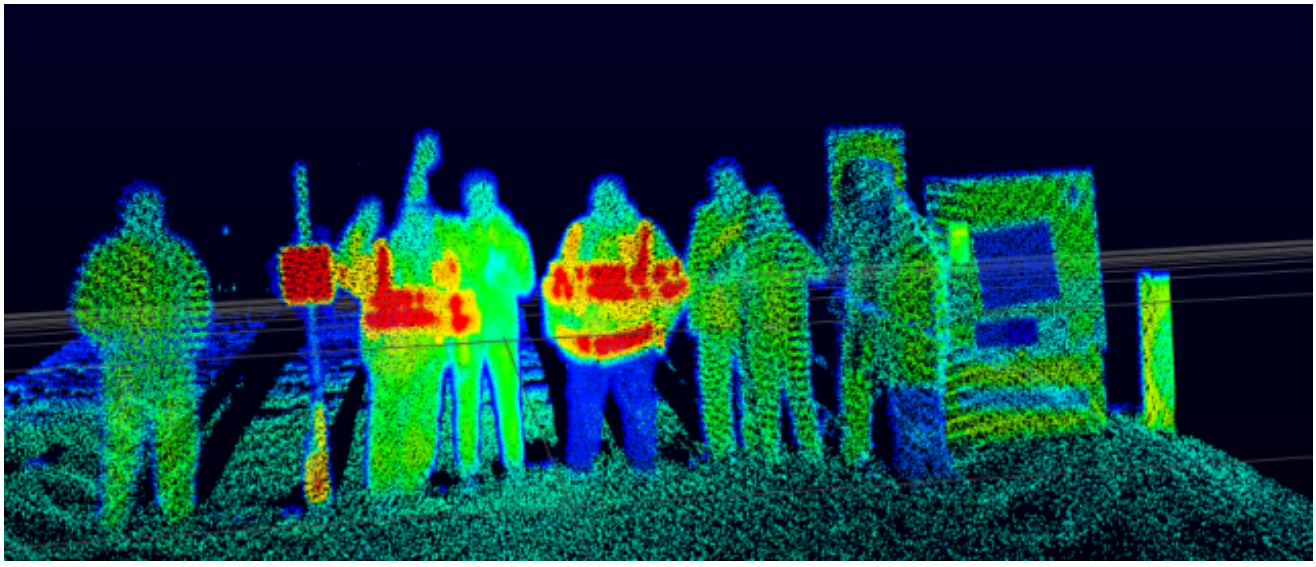
Weather observations are made at the Cardington test site to compare with sensor performance

Met Office Observations Principal Consultant Dave Jones, who is part of the team leading the weather measurement side of the Cardington testing, said: “The effect of weather on sensor performance is very complex and it is challenging to reflect this when trying to capture the weather envelope for the AV as simply as possible.

“This discussion paper gives examples of how this complexity reveals itself on our testbed and how we might begin to handle this by careful consideration of uncertainty. We are very interested in hearing views from everyone in the wider AV community involved in safety assurance.”

National Physical Laboratory’s Andre Burgess, who looks after strategic partnerships, said: “As well as the scientific and technical aspects of our joint SAF project, we are placing a huge emphasis on engagement with regulators, industry, standards bodies and academia to ensure that these testbed results make a positive difference to the AV industry and public safety.”

The discussion paper comes as the Automated Vehicles Act became law this week and paved the way for self-driving vehicles to be possibly on the UK’s roads as soon as 2026.



Lidar imagery of the team working at Cardington

Ongoing research

The Met Office and NPL’s Sensor Assurance Framework research at Cardington has been undertaken for around two years, with the aim to test sensor performance against as many different weather types as possible, including rain, hail, sunshine and fog.

The research so far demonstrates an observable relationship between weather conditions and sensor performance, though further study is needed to fully understand this area, including the impact of different locations, road surfaces, vehicle movements and a broader range of weather types. It’s hoped this research will help the autonomous vehicle industry to develop further in the coming years.

The Met Office and NPL will continue collecting weather data and assessing sensor performance in the coming months, with a new testbed at NPL’s headquarters in Teddington and plans to develop a relocatable testbed which can be deployed in a wider range of weather conditions.

The SAF principles also extend to marine autonomous vehicles. Plans are already well underway to build a demonstration testbed around Plymouth Sound UK, as part of the Maritime Autonomy Assurance Testbed (MAAT) project, which is lead by NPL and Lloyds Register with partners including

the Met Office, Plymouth Marine Lab (PML), University of Plymouth, and Warwick Manufacturing Group (WMG).

Read the AV and weather discussion paper on the NPL website.

Find out more about the Met Office's services with Connected and Autonomous Vehicles.

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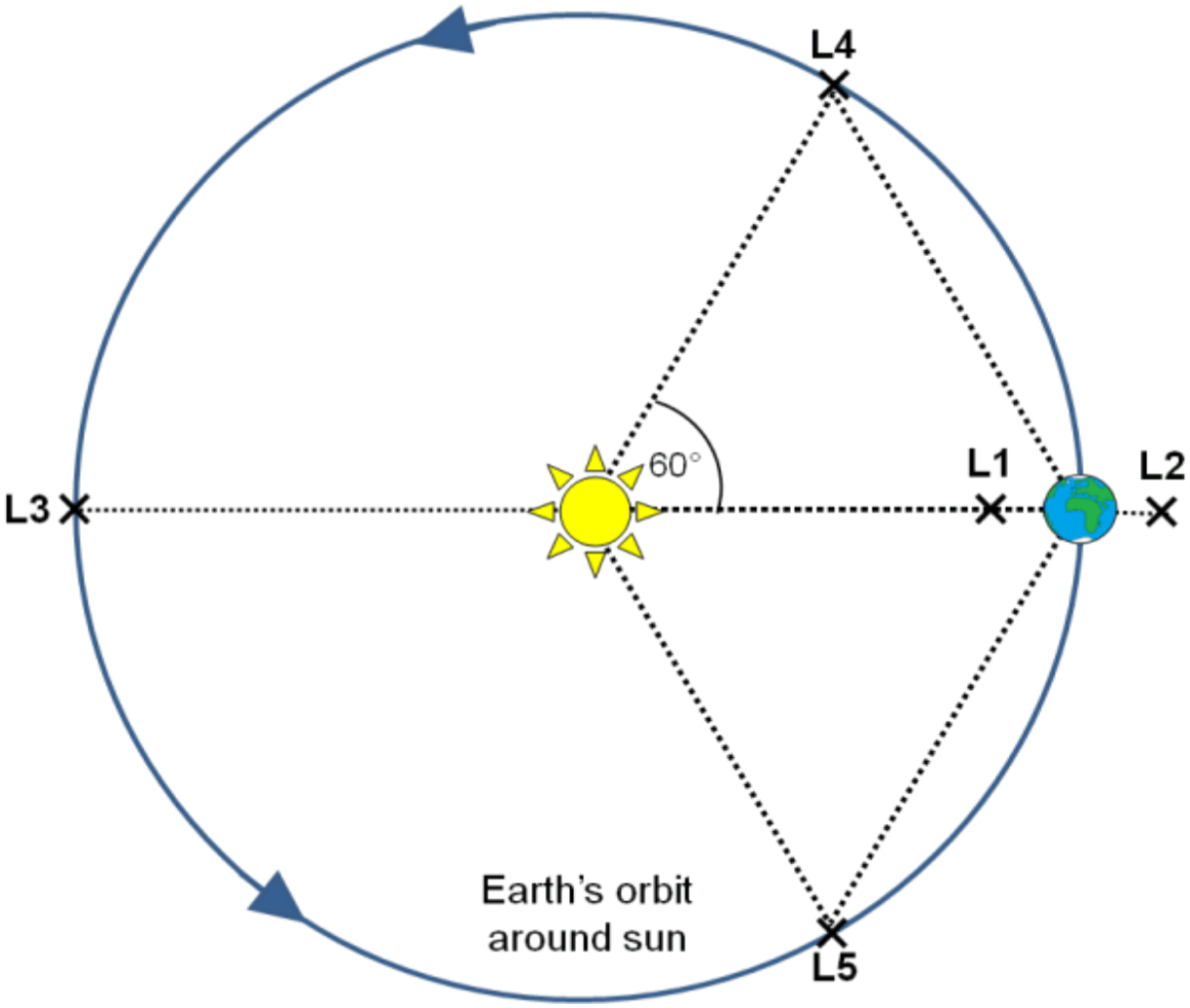
May 2024

Green light for space weather forecasting satellite

Description

The European Space Agency (ESA) today confirmed the contractors for the long-awaited Vigil mission which will transform global space weather forecasting.

The confirmation of the building of the satellite is the next step in the process positioning a satellite with a side-on view of the Sun to provide enhanced space weather forecasting.



The Met Office Space Weather Operations Centre, now celebrating its tenth year in operation, is one of a number of centres that will benefit from the new satellite.

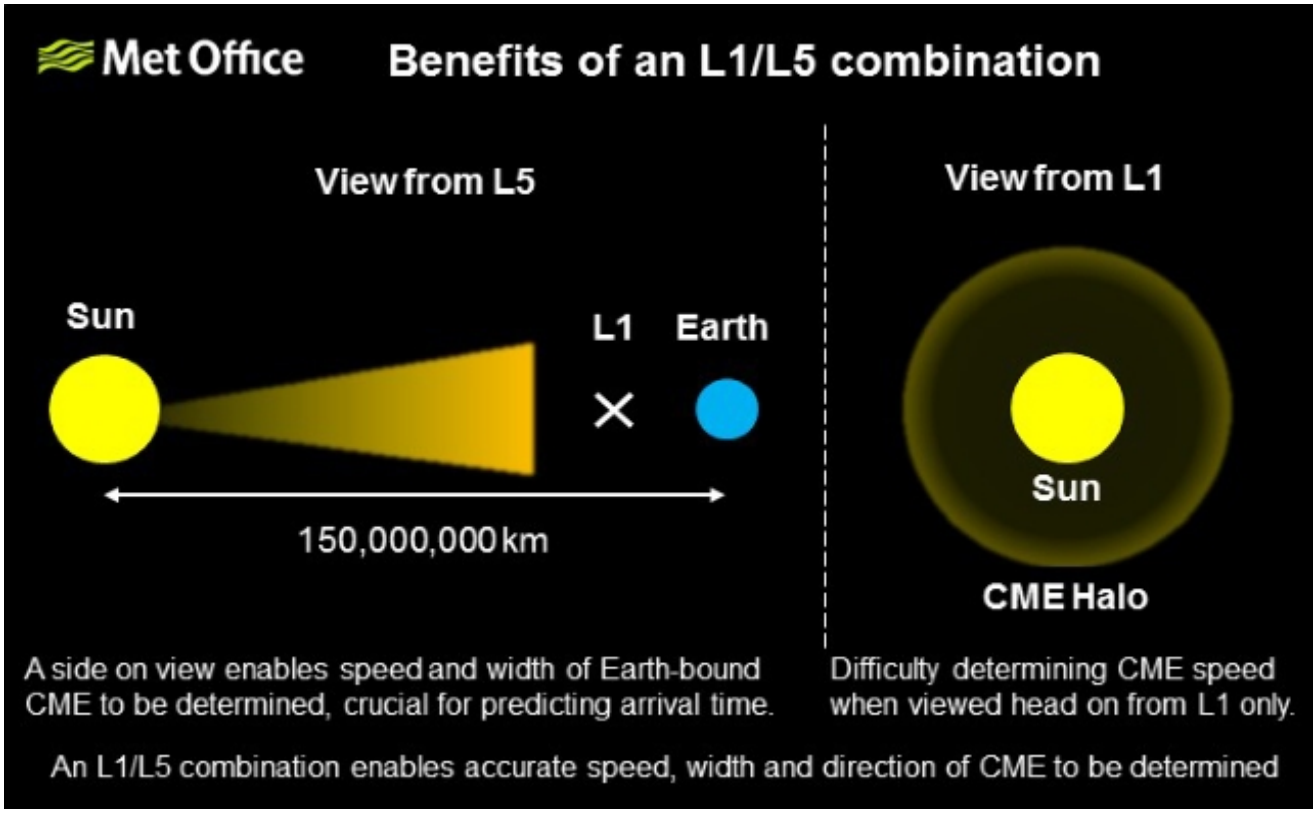
The Vigil mission, as it's known among space weather scientists, will enhance space weather forecasting capabilities and help provide more notice for potentially impactful space weather events such as coronal mass ejections.

Mark Gibbs, who leads the Met Office Space Weather Operations Centre (MOSWOC), said: “The Vigil mission represents a step-change in space weather forecasting capability. As well as replacing aging satellites, this mission will help to improve our forecasting capability and deepen our scientific understanding of coronal mass ejections (CMEs) that generate geomagnetic storms.”

Confirmation of the contract for the mission, which is being managed by the European Space Agency, represents the next milestone in the process of launching the new satellite by the end of this decade and will revolutionise imagery and data available to space weather forecasts.

Mark continued: “A side-on view of the Sun-Earth line is critical to provide accurate predictions of CME arrival at Earth. We’ll get access to more reliable, more advanced data to initialise models to predict CME arrival and also to monitor their progress as they head towards the Earth. We’ll be continuing to work with ESA to help ensure there’s as much benefit as possible to not just us at MOSWOC, but also to forecasting centres around the world. The Vigil mission will work in tandem with the current and future US missions stationed at L1.”

The news comes after geomagnetic storms two weeks ago brought aurora visibility to much of the UK in what was the strongest event since 2003 to impact Earth. While auroras provide immaculate photos, impactful space weather has the potential to affect everyone and is recognised on the UK’s National Risk Register. The ability to forecast these events can help to mitigate the worst impacts.


Met Office
Benefits of an L1/L5 combination
View from L5
Sun
L1
Earth
150,000,000 km
A side on view enables speed and width of Earth-bound CME to be determined, crucial for predicting arrival time.
View from L1
Sun
CME Halo
Difficulty determining CME speed when viewed head on from L1 only.
An L1/L5 combination enables accurate speed, width and direction of CME to be determined

Find out more about the contract announcement.

Find out more about the Met Office Space Weather Operations Centre.

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